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National College
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Schools

The impact of federations on student outcomes

Report

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Key findings

This study adopted a quantitative methodology involving a matched sample of federated and non-federated schools and utilising multi-level modelling techniques to explore the impact of federations on student outcomes. The sample involved 50 local authorities, and 264 schools. These are grouped into 122 federations, and 264 comparator schools were selected to match these. In the sample, 88.1 per cent of schools belong to a two-school federation, 8.5 per cent were part of a three-school federation, and the remainder are part of larger federations.

1. **The study identified six broad and sometimes overlapping categories of federation:**
   size federations
   cross-phase federations
   performance federations
   faith federations
   mainstreaming federations
   academy groups

   The most common category of federation in the sample was cross-phase federation and the least common category was academy groups

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2. There is **evidence of impact on overall performance,** in that while federation and comparator schools perform similarly at baseline, federation is positively related to performance in the years following federation.

3. There is **evidence to suggest that impact is strongest in performance federations.**

4. There is **no evidence of a relationship between federation and Ofsted judgements** (grades).

5. There is **no evidence of a differential impact on students** from different socio-economic settings, differences in gender or with special educational needs.

Introduction

This report is structured into four sections. The first outlines the context, aims and objectives and research approach adopted to investigate the impact of federations on student outcomes. The second section details the methods used to collect and analyse the data. The third section reports the results and the fourth presents our conclusions.

Context

Governments around the world have invested significant resources in developing collaborative approaches to school improvement. Part of the collaboration agenda has involved experimentation with new organisational forms of schooling. Michael Fullan (2004:16) argues that changing whole systems means changing the entire context in which people work and it is clear that the current context of schooling is rapidly shifting. Most recently, England has been leading the way in developing networks of schools in the form of partnerships and federations as part of the drive to improve standards. This development has been aimed at relocating innovation closer to schools in order to generate greater collective capacity for change (Hadfield and Chapman, 2009). However, to date there is very little quantitative evidence to link collaboration with school improvement and the impact of collaboration remains contested. This study aimed to examine the link between federation and student outcomes, providing a quantitative analysis to ascertain the impact of federation on academic outcomes.

Collaboration in the form of federations remains central to the government's reform agenda, particularly for schools deemed to be requiring a - 'structural solution to tackle persistent low attainment and or underachievement. Federations are considered an innovative strategy for transforming education across groups of schools, particularly those in challenging circumstances, by working together in sharing staffing, resources, professional development, curriculum development, and leadership and management.

What is a federation?

The term " federation " encompasses a broad spectrum of collaborative arrangements often used to describe a range of partnerships, clusters and collaborations. In general, groups of schools agree to work together to raise standards, promote inclusion, find new ways of approaching teaching and learning and build capacity between schools in a coherent manner. This will be brought about in part through structural changes in leadership and management, in many instances making use of the joint governance arrangements invoked in the 2002 Education Act. The establishment of a federation, often referred to as a 'hard federation', as specified in the Act, allows for the creation of a single governing body or joint governing body committee to operate across two or more (often cross-phase) schools. A collaboration, often termed 'soft federation', is where one or more governing bodies delegate some but not all of their powers to a sub-committee (with somewhat limited purpose). Whichever set-up is adopted, each partner school remains as a separate entity, headed, inspected, league tabled and funded in its own right.

It is recognised that strong levels of trust and confidence must be developed in order for schools to make the formal and binding commitments that federation requires. Collaboration at all levels is encouraged in the understanding that schools need to establish sound working relationships to ensure the long-term impact and success of the federation.

It is also acknowledged that the move towards structured and sustainable collaboration is a gradual process and therefore the process of becoming a hard federation could happen in stages. The partner schools could progress from collaborative links into a soft model of federation before becoming a hard federation, with additional partner schools perhaps joining along the way. Examples of this transition are illustrated in some of the case study profiles.

Further details about Federations, including the legal implications, can be found at:
www.standards.dfes.gov.uk/federations

Fullan, M (2004) Leadership and Sustainability: System thinkers in action, Thousand Oaks, CA: Corwin Press
Hadfield, M and Chapman, C (2009) Leading School-Based Networks, London: Routledge

Aims

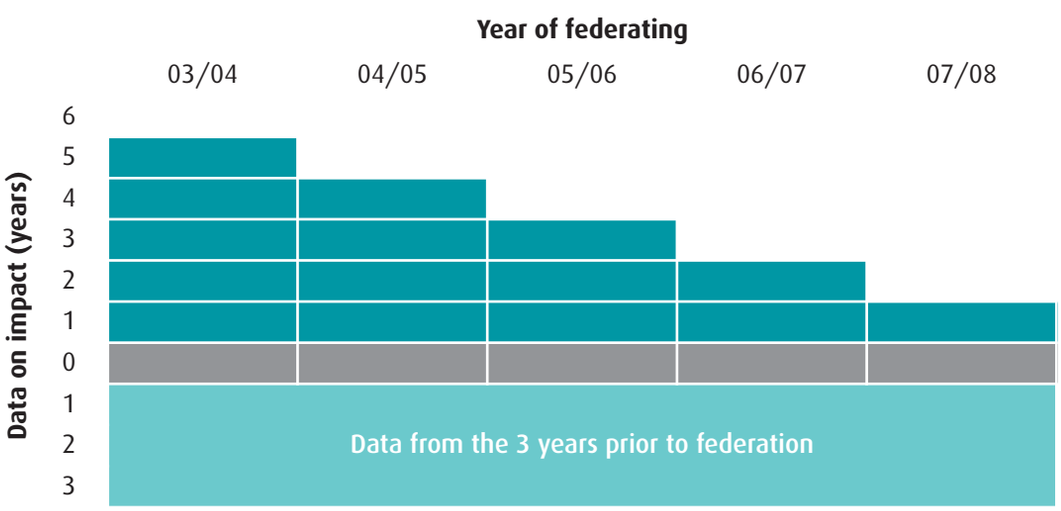
The aim of this study was to investigate the ways in which federations seek to improve student outcomes and leadership capacity and the extent of variation in their impact and abilities to promote change. The study also explored factors that facilitate the positive effects of federations and any features that act as barriers to improvement. It also examined whether some models are more effective than others in promoting better outcomes. The specific objectives of this study were to:

- investigate changes in student outcomes in federated schools in terms of key attainment indicators and value-added measures and compare these with national trends and results for schools with similar intake characteristics;
- assess the impact of federations on leadership capacity and effectiveness;
- assess the impact of federations on the quality of teaching and learning;
- assess the impact of federations on the curriculum and other aspects of schooling;
- assess the impact of federations on the provision and quality of continuing professional development (CPD) provision and other development opportunities for staff.

Research approach

Our broad approach was to develop a matched sample of schools in federations and non-federations and conduct quantitative analyses to obtain measures of the apparent impact federation has had on the educational outcomes of different groups of students over a period of one to four years. We identified schools that federated in academic years 2007/08, 2006/07, 2005/06, 2004/05 and 2003/04 and compared the examination performance of cohorts prior to federating with examination performance since federation in terms of key indicators such as the percentage of students gaining five GCSE at grades A* to C with and without English and mathematics, and in terms of value-added and contextual value added (CVA). In addition, each federation was matched with a comparator unfederated school which shared similar characteristics in terms of pupil intake, rural/urban location and profiles) to assess the effect of federation (Figure 1).

Figure 1: Sample size and extent



Methodology

A quantitative methodology was used to explore the impact of federation on student outcomes. National pupil - and school-level datasets from the Department for Children, Schools and Families (DCSF) allowed us to look at performance measures controlled for student background over time. PLASC and NPD data was requested from and provided by DCSF for this purpose. Data was collected for each year from 2001 to 2008. Ofsted grades were provided by the National College.

As no definitive list of federations exists, a random sample of 50 local authorities was selected. Each local authority was contacted and asked to identify federations and the schools that were a part of them. A total of 264 schools and 122 federations were identified in this way.

Follow-up calls were made to each of the schools to:

- uncover any errors in the designation of the school as a federation
- collect additional data on the date the schools federated, the number of heads and federation structure

Several schools/federations were identified that had ceased to operate or did not fit the criteria for federation. These were replaced with other schools/federations.

In order to look at the impact of federation on performance, we opted for a quasi-experimental design where each federation school was matched to a school as similar as possible on key characteristics prior to federating. National datasets were used to match schools by:

- phase (eg, primary, middle, secondary)
- type of school (eg, voluntary aided, voluntary controlled, academy)
- gender intake (co-educational, single-sex boys, single-sex girls)
- performance levels (eg, percentage achieving key stage (KS) threshold levels in English and maths)*
- pupil intake characteristics (percentage pupils identified as having special educational needs (SEN))
- location (this measure went beyond traditional rural/urban identification, and attempted to match areas that were as similar as possible in terms of socio-demographic characteristics by using local authorities' statistical neighbours, eg, Cambridge would be matched to York, Salford to Gateshead)
- school size (as indicated by pupil roll)

Obviously no schools could be matched identically on these criteria. However, as close a match as possible was sought in all cases.

As with the federation schools, all comparator schools were contacted by a member of the research team to:

- ascertain that they were not part of federation
- to collect data on headship and governance

A number of schools had to be replaced as they were part of a federation or had ceased to operate.

A range of quantitative methodologies was used to analyse the data, including univariate and multivariate statistics and multilevel modeling. The Stata and MLWin software packages were used for these analyses.

Sample characteristics

The final sample contained 50 local authorities, and 264 schools. These are grouped into 122 federations, and 264 comparator schools were selected to match these.

In the sample, 88.1 per cent of schools belonged to a two-school federation, 8.5 per cent were part of a three-school federation with the remainder being part of larger federations.

The distribution of schools across phases is given in Table 1.

*(expected achievement for a given key stage (eg for keystage4 5+ A-C at GCSE including Eng and maths))

Table 1: Distribution of schools across phases

School phase	%
Nursery	3.8
Infant	7.2
Junior	7.2
Primary	39.6
First	9.0
Middle	5.3
High	1.9
Secondary	22.3
Special	3.7

In the sample, 11.3 per cent of schools were Catholic, 16.2 per cent were Church of England and, 4.1 per cent were academies.

The federations in the study tended to have been formed relatively recently, reflecting a rapid development in this area (Table 2).

Table 2: Year of formation of federations

Year formed	%
2001 and earlier	1.79
2002	0.00
2003	0.00
2004	1.79
2005	4.46
2006	17.86
2007	32.59
2008	33.48
2009	8.04

Most federations in the sample were formed in either 2007 or 2008, with just over a quarter formed in 2005 or earlier.

We found that 81 per cent of federations had a joint headteacher, while 15 per cent had a joint governing body.

Table 3: Number of headteachers in the past five years

Number of heads in last five years	% federation schools	% Comparator schools
1	49.55	49.54
2	35.59	38.99
3	10.36	9.17
4	3.6	1.94
5	0.9	0.46

Almost half of the schools surveyed had had only one headteacher in the past five years, with over a third having had two. There were very few differences between federation and comparator schools in this regard.

Federation and comparator schools were compared on key intake variables.

Schools were exactly matched on:
- school type
- gender intake
- phase

Table 4 shows the match for the variables pupil roll, SEN percentage, and the percentage of pupils reach the threshold targets for English and maths respectively.

Table 4: Characteristics of federation and comparator schools on key variables

	Federation mean	Comparator mean	t
Pupil roll	287.9	281.4	-0.74
% pupils with SEN	30.2	31.6	1.35
% reaching threshold targets in English	79.2	77.9	0.98
% reaching threshold targets in maths	74.3	76.8	1.96*

*=significant difference at the .05 level

The only significant difference was on achievement of the threshold targets for maths where comparator schools significantly outperformed federation schools, though the difference was small.

Results

Typology of federation

The data was interrogated to identify types of federation. Six types were identified:

- cross-phase federations consisting of two or more schools of different phases, eg, a primary and secondary school, or a first, middle and high school (accounting for 35 per cent of schools in the sample)
- performance federations consisting of (most usually) two, or more schools, some of which are low, and others high performing (accounting for 16 per cent of schools in the sample)
- size federations consisting of two or more very small or small schools, or a small school and a medium - sized school (accounting for 19 per cent of schools in the sample)
- mainstreaming federations consisting of one or more special schools combined with one or more mainstream schools (accounting for 5 per cent of schools in the sample)
- faith federations consisting of two or more schools of the same denomination occasionally overlapping with one of the above five types (accounting for 15 per cent of schools in the sample)
- academy federations consisting of two or more academies run by the same sponsor (accounting for 2 per cent of schools in the sample)
- 8 per cent of schools in the sample were in federations that weren't immediately classifiable as one of the above types

Impact on performance

Multilevel statistical models were used to look at the impact of federation on performance. This was done only for the federations formed in 2005 and earlier and 2006, as no impact is to be expected for those federations formed in 2007 and later in the light of previous research on the length of time it takes for federations to become fully operational (see Lindsay et al, 2003). Levels were school (level 2) and pupil (level 1). As the data relates to different cohorts in different years, analysis of each year was done separately.

Models were tested for the year of formation and data for the previous three years combined, and for subsequent years up to 2008. A null model was formulated with no predictors. In the next model federation was added, while in the final model for each year, other indicators of achievement were included, such as gender, SEN status and FSM eligibility. Outcome variables were pupil-level achievement, such as KS levels or the percentage of A*-C grades at GCSE. As our variable of interest was a school-level variables, all predictors in the analyses are school-level variables.

Lindsay, G Harris, A Muijs, D Chapman, C et al. (2007)
Final report on the evaluation of the federations programme. London: DCSF

2005 cohort
Primary

In the 2005 cohort, analyses are only presented for the primary phase (KS2) because the sample of secondary schools for this cohort was four (making a total of eight schools including comparators) and thus too small to provide stable estimates.

Table 5: Baseline Multilevel model

	English – null model - coefficient (standard error)	English – full model - Coefficient (standard error)	Maths – null model - coefficient (standard error)	Maths – full model - coefficient (standard error)
Intercept	9.46 (3.86)	12.3 (5.38)	6.1 (2.7)	5.89 (3.8)
Federated?		NS		NS
Gender		NS		NS
Age		NS		NS
FSM		NS		NS
SEN		NS		NS
School size		NS		NS
Level 2 percentage variance	11.7	11.2	12.3	12.1
Level 1 percentage variance	88.3	88.8	87.7	87.9
Explained percentage variance level 2		5.3%		3.2%
Explained percentage variance level 1		0.0%		0.0%
Total percentage explained variance		0.6%		0.2%

NS=variable not significant

Table 6: 2006 Multilevel models

	English – null model - coefficient (standard error)	English – full model - coefficient (standard error)	Maths – null model - coefficient (standard error)	Maths – full model - coefficient (standard error)
Intercept	5.1 (1.3)	12.3 (5.38)	5.1 (0.4)	10.2 (3.8)
Federated		NS		2.5 (1.1)
Gender		NS		NS
Age		NS		NS
FSM		NS		NS
SEN		NS		NS
School size		NS		NS
Level 2 percentage variance	10.8	10.2	12.8	9.5
Level 1 percentage variance	89.2	89.8	87.2	92.5
Explained percentage variance level 2		4.7%		36.5%
Explained percentage variance level 1		0.0%		1.2%
Total percentage explained variance		0.4%		4.7%

NS=variable not significant

Table 7: 2007 measure

	English – null model - coefficient (standard error)	English – full model - coefficient (standard error)	Maths – null model - coefficient (standard error)	Maths – full model - coefficient (standard error)
Intercept	6.4 (1.1)	5.6 1.0)	5.1 (0.4)	10.2 (3.8)
Federated		3.1 (1.4)		3.8 (1.1)
Gender		NS		NS
Age		NS		NS
FSM		NS		NS
SEN		NS		NS
School size		NS		NS
Level 2 percentage variance	14.9	9.4%	12.8	7.5
Level 1 percentage variance	85.1	90.6	87.2	92.5
Explained percentage variance level 2		38.9%		46.5%
Explained percentage variance level 1		0.0%		1.2%
Total percentage explained variance		6.1%		6.6%

NS= Variable not significant

Tables 5 to 7 show that for the 2005 cohort there is some evidence of impact of federation over time. Overall, the majority of variance in both English and maths is explained at the pupil level (level 1). However, variance at the school level is also significant. It is important here to point out that pupil-level variance is not the same thing as pupil social background, as is often wrongly supposed. Rather, this may be a range of factors, including ability, motivation, and, to a large extent, measurement error.

As the samples were carefully matched on these variables, it is not surprising that most predictors were not significantly related to the outcomes. Federation is significantly related to outcomes in maths in 2006 and 2007, and to outcomes in English in 2007. This is suggestive of impact, although other factors, such as prior capacity to change in federation (as opposed to non-federation) schools may of course be a causal factor as well. The impact of federation is quite strong in 2007, explaining nearly half of school-level variance in maths, and over a third of school-level variance in English, making it a highly significant factor.

2006 cohort
Primary

Table 8: Baseline measures

	English – null model - coefficient (standard error)	English – full model - coefficient (standard error)	Maths – null model - coefficient (standard error)	Maths – full model - coefficient (standard error)
Intercept	4.2 (0.03)	4.6 (0.09)	4.1 (0.4)	4.3 (0.1)
Federated		NS		NS
Gender		NS		NS
Age		NS		NS
FSM		NS		NS
SEN		-0.015 (0.005)		-0.009 (0.004)
School size		NS	NS	
Level 2 percentage variance	12.8	10.2	15.4	13.9
Level 1 percentage variance	87.2	89.8	84.6	86.1
Explained percentage variance level 2		4.7%		5.2%
Explained percentage variance level 1		0.0%		0.2%
Total percentage explained variance		0.4%		0.7%

NS=Variable not significant

Table 9: 2007 measure

	English – null Model - coefficient (standard error)	English – full model - coefficient (standard error)	Maths – null model - coefficient (standard error)	Maths – full model - coefficient (standard error)
Intercept 7.6	(1.3)	8.7 (0.7)	5.3 (0.6)	6.5 (0.8)
Federated		2.4 (0.9)		3.1 (1.1)
Gender		NS		NS
Age		NS		NS
FSM		NS		NS
SEN		0.02 (0.01)		0.016 (0.007)
Number of heads (between 2006 - 2009)		NS		NS
Level 2 percentage variance	13.2%	11.1%	15.8	12.7
Level 1 percentage variance	86.8	88.9	84.2	87.3
Explained percentage variance level 2		19.9%		22.7%
Explained percentage variance level 1		0.0%		0.%
Total percentage explained variance		2.3%		2.8%

NS=Variable not significant

For the 2006 cohort we can again see some evidence of the impact of federation over time. Overall, the majority of the variance in both English and maths is explained at the pupil level (level 1). However, variance at the school level is also significant, and slightly larger for this cohort than for the 2005 cohort.

The variables on which the samples were matched were in general not significantly related to the outcomes. However, there was a weak significant relationship between the percentage of pupils with SEN and outcomes. Federation is significantly related to outcomes in English and maths in 2007, and not at baseline. This is suggestive of impact, as again there appears to be an increase in impact over time. The impact of federation is quite strong in 2007, explaining nearly around 20 per cent of the variance in outcomes.

Secondary

Table 10: Baseline measures

	Average points score at GCSE – null model	Average points score at GCSE – full model
Intercept 10.42	(0.22)	12.0 (0.94)
Federated		NS
Gender		NS
Age		NS
FSM		NS
SEN		NS
School size		NS
Level 2 percentage variance	17.6%	16.2
Level 1 percentage variance	82.4	83.8
Explained percentage variance level 2		3.8%
Explained percentage variance level 1		0.2%
Total percentage explained variance		0.7%

NS=Variable not significant

Similar results are found for GCSE (Table 10 and Table 11). Overall, the majority of the variance in both English and maths is explained at the pupil level (level 1), with between 15 per cent and 20 per cent of the variance being at the school level.

As in the primary schools, most predictors were not significantly related to the outcomes. Federation is significantly related to outcomes in 2007, and not in 2006. This is suggestive of impact, over time. The impact of federation is quite strong in 2007, explaining around 20 per cent of the variance in outcomes.

Table 11: 2007 measures

	Average points score at GCSE – null model	Average points score at GCSE – full model
Intercept	7.6 (1.3)	8.0 (0.6)
Federated		5.4 (2.6)
Gender		NS
Age		NS
FSM		NS
SEN		NS
Number of heads (between 2006 - 2009)		NS
Level 2 percentage variance	19.0%	15.7%
Level 1 percentage variance	81.0	84.3
Explained percentage variance level 2		20.5%
Explained percentage variance level 1		0.0%
Total percentage explained variance		3.9%

NS=Variable not significant

Impact on performance by federation type

In this section we will look at performance in the different types of federation. As sample sizes at level 2 (school level) are small in many cases, multilevel estimates may be unstable. Therefore we have used simple bivariate analyses to explore this question, which we would be able to interrogate in more detail if we had a larger sample of schools.

2005 cohort

Cross-phase federation

Table 12: Cross-phase federations (English)

	Federation mean	Comparator mean	t
Baseline	4.1	3.8	-3.6
2006	4.2	3.6	-6.5**
2007	4.2	3.7	-5.7**

*=sig at the .05 level, *=sig at the .01 level, ***=sig at the .001 level

Table 13: Cross-phase federations (maths)

	Federation mean	Comparator mean	t
Baseline	4.0	3.7	-4.0
2006	4.2	3.6	-5.7**
2007	4.3	3.6	-5.9**

*=sig at the .05 level, *=sig at the .01 level, ***=sig at the .001 level

While no differences were found between federations and comparator schools at baseline, in 2006 and 2007 federation schools showed higher levels of performance than comparator schools.

Size federations

Table 14: Size federations (English)

	Federation mean	Comparator mean	t
Baseline	4.3	4.2	-1.0
2006	4.3	4.1	-1.2
2007	4.4	4.0	-2.1

*=sig at the .05 level, *=sig at the .01 level, ***=sig at the .001 level

Table 15: Size federations (maths)

	Federation mean	Comparator mean	t
Baseline	4.2	4.2	0.0
2006	4.3	4.2	-0.7
2007	4.3	4.1	-1.1

*=sig at the .05 level, *=sig at the .01 level, ***=sig at the .001 level

No significant differences were found for size federations.

Performance, mainstreaming and faith federations were too few in number in this cohort for us to conduct analyses.

Tables 12-15 show that there is evidence that cross-phase federations may have a positive impact on performance over time, in that federation schools in this category outperformed comparator schools in 2006 and 2007, but not in 2005. There was no corresponding evidence for size federations, although the discovery of signficant evidence may have been affected by the smaller sample size.

2007 cohort
Primary

Cross-phase federation

Table 16: Cross-phase federations (English)

	Federation mean	Comparator mean	t
Baseline	4.1	4.1	0.0
2007	4.1	4.0	2.7

Table 17: Cross-phase federations (maths)

	Federation mean	Comparator mean	t
Baseline	4.0	4.0	0.1
2007	4.0	4.0	0.3

No significant differences were found for cross-phase federations in primary for the 2007 cohort.

Performance Federations

Table 18: Performance federations - English

	Federation mean	Comparator mean	t
Baseline	4.1	4.1	0.1
2007	4.2	3.8	2.9**

Table 19: Performance federations (maths)

	Federation mean	Comparator mean	t
Baseline	4.1	4.2	1.0
2007	4.3	3.7	4.1***

While no differences were found at baseline, in 2007 attainment in performance federations was significantly higher than in comparator schools in 2007.

Size federations

Table 20: Size federations (English)

	Federation mean	Comparator mean	t
Baseline	4.1	4.4	-2.5*
2007	4.0	4.2	-1.5

Table 21: Size federations (maths)

	Federation mean	Comparator mean	t
Baseline	4.1	4.3	-1.2
2007	4.0	4.1	-0.8

Comparator schools showed a better performance than federations in English at baseline. No other significant differences were found.

Faith federations

Table 22: Faith federations (English)

	Federation mean	Comparator mean	t
Baseline	4.1	4.1	-0.2
2007	4.1	3.9	1.2

Table 23: Faith federations (maths)

	Federation mean	Comparator mean	t
Baseline	4.1	4.0	0.7
2007	4.0	3.9	0.5

No significant differences were found for faith federations.

*=sig at the .05 level, *=sig at the .01 level, ***=sig at the .001 level

Mainstreaming federations were too few in number in this cohort for us to conduct analyses.

The only significant differences found were for performance federations in 2007 in both English and maths, where students outperformed their counterparts in the comparator schools (this had not been the case at baseline), and for size federations in English at baseline, where comparator schools did better than federation schools. This was no longer the case in 2007.

Overall, it would appear that the main differences in performance between federation and comparator schools appear in performance federations. The evidence for cross-phase federations is mixed, while few or no significant differences were found for the other types. It has to be pointed out though that in many cases sample sizes were too small to include particular federation types in the analyses.

Secondary

Cross-phase federation

Table 24: Cross-phase federations

	Federation mean	Comparator mean	t
Baseline	341.5	351.8 -	3.8***
2007	341.2	353.9 -	2.6**

Performance federation

Table 25: Performance federations

	Federation mean	Comparator mean	t
Baseline	295.6	274.8	1.9
2007	324.9	251.4	12.3***

Notably in the secondary sample only cross-phase and performance federations were present in sufficient numbers for analysis. In the data for cross-phase Federations, comparator schools showed significantly higher levels of performance in both years. For performance federations, there was a non-significant advantage for performance schools at baseline, and a highly significant advantage for performance schools in 2007.

Overall, it would appear that the main differences in performance between federation and comparator schools appear in performance federations.
The evidence for cross-phase federations is mixed, while few or no significant differences were found for the other types. It has to be pointed out though that in many cases sample sizes were too small to include particular federation types in the analyses.

Relationship to Ofsted grades

In this section we will explore the extent to which there is a relationship between federation and Ofsted inspection grades. In this analysis, all types and phases are combined. Because inspection does not occur annually, in each school, the comparisons refer to school inspections undertaken in different years, so any findings have to be considered indicative only.

Table 26: 2005 inspections

Variable	Federation	Comparator	t
Overall effectiveness of provision	4.8	4.6	-0.6
Quality of teaching	3.6	3.5	-0.2
How well do learners achieve?	3.3	3.2	-0.1
Overall effectiveness of leadership and management	3.0	3.3	1.0

Table 27: 2006 inspections

Variable	Federation	Comparator	t
Overall effectiveness of provision	3.5	3.6	-0.1
Quality of teaching	2.4	2.4	0.1
How well do learners achieve?	2.5	2.5	0.2
Overall effectiveness of leadership and management	2.3	2.4	0.7

Table 28: 2007 Inspections

Variable	Federation	Comparator	t
Overall effectiveness of provision	2.5	2.5	0.2
Quality of teaching	2.6	2.5	0.4
How well do learners achieve?	2.3	2.4	0.6
Overall effectiveness of leadership and management	2.1	2.1	-0.1

No significant differences were found between federation and comparator schools in any of the analyses made for inspection ratings. However, it has to be pointed out that sample sizes were small.

Conclusion

Our analysis leads us to conclude that federations can have a positive impact on student outcomes and that the impact is greatest where the aim of the federation is to raise educational standards by federating high - and lower - attaining schools.

This initial analysis would suggest that persisting with the policy of federating schools to raise standards is a worthwhile enterprise.

However, if federations are to continue to be used as a structural solution we would draw attention to three major challenges within the system:

- stimulating and developing collaboration both within and between schools in very challenging contexts

- developing appropriate accountability systems that move beyond single institutions as primary unit of analysis.

- inspiring localised context - specific approaches to improvement within an overarching national framework of intervention, such as the National Challenge.

These challenges need further exploration, including discussions with performance federation leaders to draw out the key issues related to the three challenges and the facilitators and barriers experienced while establishing a federation.

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